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ABSTRACT

Because of the increasingly diversified population and needs of adult students at the Alberta Vocational Centre, a more flexible and responsible learning environment was needed. A brief effort using PLATO hardware and Basic Skills courseware for grades 3-8, and then for high school equivalency programs, was successful. However, it would have been too cumbersome and expensive for long-term, widespread use, because of the large amount of hardware that would have been required, and the necessity for teachers to make radical changes in their teaching styles. In 1983, efforts began to develop computer-managed learning (CML) by converting an existing basic mathematics course to computer management using PLATO Learning Management (PLM). PLM is an author system that permits development of tests and drills by non-programmers. Once developed, PLM-based materials incorporate PLATO's extensive recordkeeping capabilities with high reliability, graphics, and telecommunications. Results of this project indicated that students whose achievement had been minimal under conventional teacher-directed learning conditions could improve their learning, and could cope successfully--even happily--with computer management. Becasue of the success of the CML venture, a project to use it in the nursing assistant program at Alberta Vocational Centre will be implemented in September of 1986. CML is an application of technology with powerful potential to reorganize the learning environment and the learning experience for both students and teachers; it reorganizes the learning experience without completely changing the teaching experience. With CML, both teachers and students can be shown and can experience the liberating power of this technology. (KC)

MAKING TECHNOLOGY WORK IN ADULT EDUCATION: PLATO Computer-Managed Learning at the Alberta Vocational Centre, Edmonton*

by

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ORIGINAL PROBLEM

The need to investigate computer-based learning (CBL) in general, and computer-managed learning (CML) in particular, was forced on the Alberta Vocational Centre, Edmonton (AVC) by several developments which originated in the mid-1970s. Table 1 shows some changes in characteristics of the institution's students from that time to the present.

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Table 1: Student Characteristics, 1972, 1977, 1985

Item		1972	1977	1985
Average age (years)		28.0	26.4	27.5
Sex:	Male	43%	29%	40%
	Female	57	71	60
Marital Status	Married	40%	29%	27%
	Single	35	47	53
	Other	25	24	20
Students with dependents		49%	43%	31%
Welfare recipients		9%	12%	22%

The most significant changes over this period were toward a somewhat younger student body, composed of more single women with dependents, often reliant on social assistance (welfare). Another development was the tendency of students not to stay as long as previously at the institution: the average stay in 1977 was 6.5 months as compared with 7.3 months in 1972.

Some implications of these changes identified for learning/teaching were:

-- Students exhibited increasing variety in personal and academic characteristics, including motivation and prior learning (characteristics which Bloom [1976] had advised were crucial to subsequent learning).

-- Students' goals were increasingly diverse, ranging from basic literacy to high school equivalency.

-- Students' home and family responsibilities, always a factor, were becoming more of a preoccupation.

-- Many students were coming to AVC from a history of previous personal and academic failure.

These problems notwithstanding, the institution was determined to provide a "comprehensive range of needed educational programs" for this clientele. It was also committed to providing a flexible, responsive environment supportive of students' needs and desires for more self-direction. It was constrained in its search for computer-based technologies to address these needs, however, in that it could not afford to develop extensive, unique programs, much less pioneer new technologies. It could also not afford the capital expense of purchasing most existing technolcgies. In a word, a "turn-key" solution was needed.

Initial Solutions

Briefly, first efforts to provide a more flexible and responsive learning environment involved leased PLATO hardware and Basic Skills courseware (grades 3 to 8), in 1979-80 (Fahy, 1984a). This experience was successful enough to lead to experiments with distance learning via PLATO, expanded to include GED programming, in 1981-82. Both of these projects were examples of computer-assisted learning (CAL): the computer was both teacher and record-keeper.

While these projects were successful in meeting their limited objectives, several factors prompted interest in computer-managed learning, where teaching materials and activities would not primarily be computer-based, but testing and recordkeeping would be. Chief among these were the costs associated with CAL: in order to provide CAL opportunities for

large numbers of students large amounts of hardware would be required. Also, CML was judged to be easier for instructors to assimilate for their first experiences with CBL, as they would remain in their familiar instructional role while entrusting clerical duties to the computer. Finally, CML would be more quickly developed, as experience showed that test banks could be developed on the PLATO system using PLM (see below) at an average of about 5 minutes per item.

CML Via PLATO

Beginning in 1983 efforts commenced at AVC to develop CML, with conversion of an existing basic mathematics course to computer-management using PLATO Learning Management (PLM). PLM is an author system which permits development of tests and drills by non-programmers (Control Data Corporation, 1982). Once developed, PLM-based materials incorporate PLATO's extensive recordkeeping capabilites with high reliability, graphics, and telecommunications. (Fahy, 1984b).

Results of this project indicated that students whose achievement had been minimal under conventional teacher-directed learning conditions could improve their learning, and could cope successfully -- even happily -- with computer-management: affective responses to PLATO were positive by students and most instructors. Among some instructors the fear arose that human contact between student and teacher might be lost with CBL, including CML. Instructors who held this view usually changed it with further direct experience (Fahy, 1984b).

A year earlier, a small CML project had been conducted in the institution's Nursing Assistant program, using PLM. Results of this project were positive and led to AVC's most ambitious project in CML, described next.

PROJECTIONS

Currently, the Nursing Assistant program at AVC is developing PLM-based CML to manage the testing and recordkeeping chores in its 92-module, competency-based curriculum. Presently, the program employs an Instructional Aide to handle test administration and marking, but cannot normally accommodate student self-pacing either above or below the average pace of the group. The goal of the CML project in this area is to provide student self-pacing and encourage self-direction. To accomplish inputing of the tests a clerk-typist was trained in two one-and-one-half hour sessions. This person's efforts are coordinated by an experienced Nursing Assistant staff member -- who describes herself as "computer-naive". Initial goals are to pilot several module tests in January and February, 1986, and to complete construction of the test bank by April. The Nursing Assistant program should have CML via PLATO in place for all students by September, 1986. After that, the next thrust will likely be toward distance delivery of the Nursing Assistant program, with CML support, in hospitals and nursing homes throughout the Province.

CONCLUDING COMMENTS

CML is an application of technology with powerful potential to reorganize the learning environment and the learning experience for both students and teachers. Both groups stand to gain flexibility from CML, but great care must be taken, as with any innovation, to present its advantages clearly, and to anticipate and deal with the inevitable negative reactions change brings from some. Teachers will want to know what difference CML will make to them, before they car appreciate what it will mean to their students. This should not be surprising: security needs must be met before arguments about higher needs will be appreciated. And the students themselves will need time for orientation and adjustment.

Brudner (1982) has argued that CML is the greatest need of schools using computers in the learning/teaching process. His reasons are that CML reorganizes the learning experience, without completely changing the teaching experience. Our experience at AVC supports this view: with CML, teachers can give students more attention, and can accommodate more unique learning needs. CML permits individualization without burying the teacher in paperwork. With CML, both teachers and students can be shown and can experience the liberating power of this effective technology.

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